ONTARIO MINISTRY OF ENVIRONMENT
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1966 OPERATING SUMMARY

OWEN SOUND

water pollution control plant

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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

TD
367
.A56
O94
1966

Owen Sound : water pollution
control plant.
81789

ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

Members of the Owen Sound Local Advisory Committee,
City of Owen Sound.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the Owen Sound Water Pollution Control Plant, OWRC Project No. 60-S-68.

It is hoped that our joint participation in efforts to combat water pollution will have even more success in the coming year.

Yours very truly,

D. S. Caverly,
General Manager.

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FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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OWEN SOUND

water pollution control plant

operated for

THE CITY OF OWEN SOUND

by the

ONTARIO WATER RESOURCES COMMISSION

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Assistant Director: C. W. Perry
Regional Supervisor: A. C. Beattie
Operations Engineer: A. Clark

801 Bay Street Toronto 5

'66 REVIEW

The total flow to the plant in 1966 was 1166. 20 million gallons, an average of 3. 2 mgd. This is a reduction of 0. 2 mgd from the average flow in 1965, and is slightly in excess of the plant capacity of 3. 0 mgd. The strength of the raw sewage, 100 ppm BOD and 181 ppm SS, is below normal. Since the sewer system is a combined one, the volume of flow will depend to a considerable extent on weather conditions.

The cost of operation was $36, 736. 62, or $31. 52 per million gallons.

During 1966, the plant staff was comprised of a chief operator, two operators and a labourer. Operation was supervised eight hours per day, seven days per week.

PROJECT COSTS

NET CAPITAL COST (Final)		$1,467,321.96
DEDUCT - Portion Financed by CMHC (Estimated)	$996.392.74	
- Payments from Municipalities	30,758.65	1,027,151.39
Long Term Debt to OWRC		$ 440,170.57
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966		$ 41,904.54

Net Operating	$ 36,763.62
Debt Retirement	8,883.00
Reserve	9,323.87
Interest Charged	24,764.96
TOTAL	$ 79,735.45

RESERVE ACCOUNT

Balance at January 1, 1966	$ 31,240.85
Deposited by Municipality	9,323.87
Interest Earned	1,932.59
Less Expenditures	$ -
Balance at December 31, 1966	$ 42,497.31

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER
JAN	1837.73	1374.81		143.50			48.67		254.74	16.06	
FEB	2679.57	1350.07		201.41	379.90		48.49	8.44	9.10	560.95	121.2
MARCH	3057.43	1371.25		110.81	398.52		98.64	190.13	233.50	526.00	128.58
APRIL	4446.64	2252.08		120.65	476.72		73.01	16.85	387.08	1019.05	101.20
MAY	3669.13	1497.82		29.90	397.26	1470.00	66.31		74.06	30.89	102.89
JUNE	3083.62	1680.50		158.31	360.63		131.08	153.94	357.90	58.48	182.78
JULY	2622.62	1442.54		67.50	374.32		70.41	19.15	271.25	171.58	205.87
AUG	2766.28	1449.94			349.13		60.76		128.93	577.56	199.96
SEPT	2998.52	2151.48			366.75				1.33	250.66	228.30
OCT	3058.65	1455.12			421.48		75.18	59.82	33.05	778.91	235.09
NOV	2414.51	1442.54		70.36	349.39		101.80	17.39	189.19	21.00	222.84
DEC	4128.92	1451.95		158.31	839.94		261.55		39.46	1084.90	292.81
TOTAL	36763.62	18920.10		1060.75	4714.04	1470.00	1035.85	465.72	1979.59	5096.04	2021.53

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $2984.10

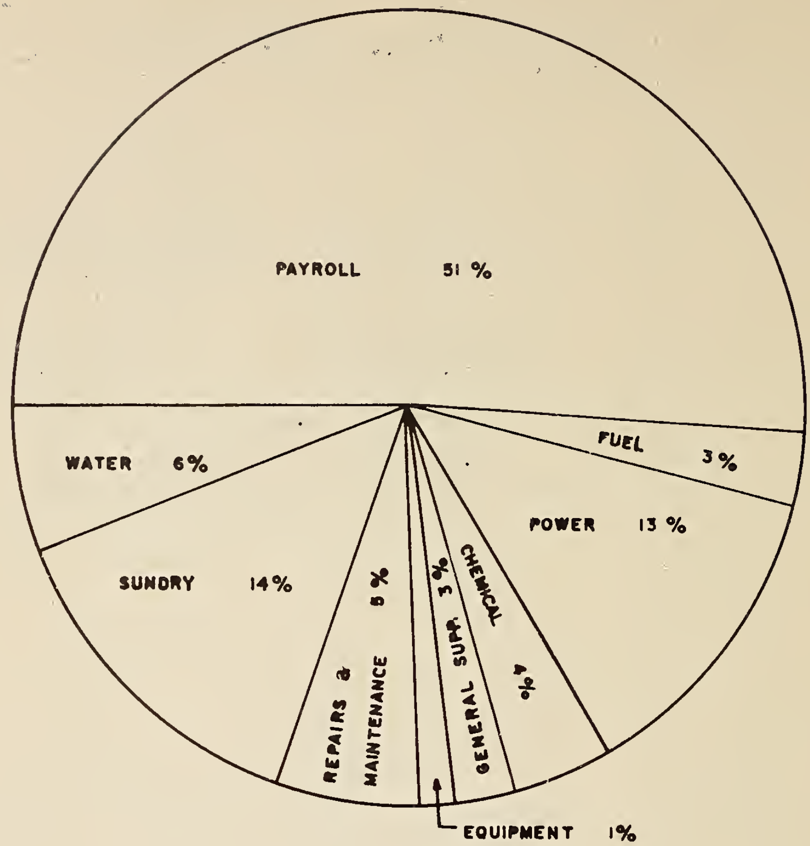
BRACKETS INDICATE CREDIT

YEARLY OPERATING COSTS

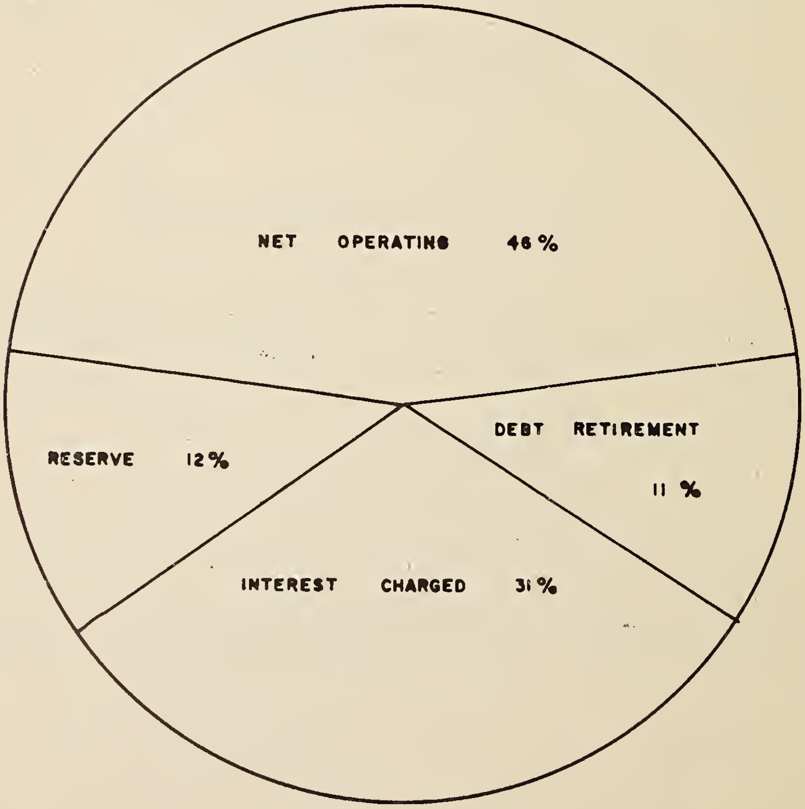
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1963	1164.493	$25012.46	* $5.46	$21.50	1½ CENTS
1964	1147.207	$27331.80	5.96	23.82	3 CENTS
1965	1236.31	$34109.32	7.41	27.59	6 CENTS
1966	1166.20	$36736.62	8.00	31.52	6 CENTS

* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

1966 OPERATING COSTS

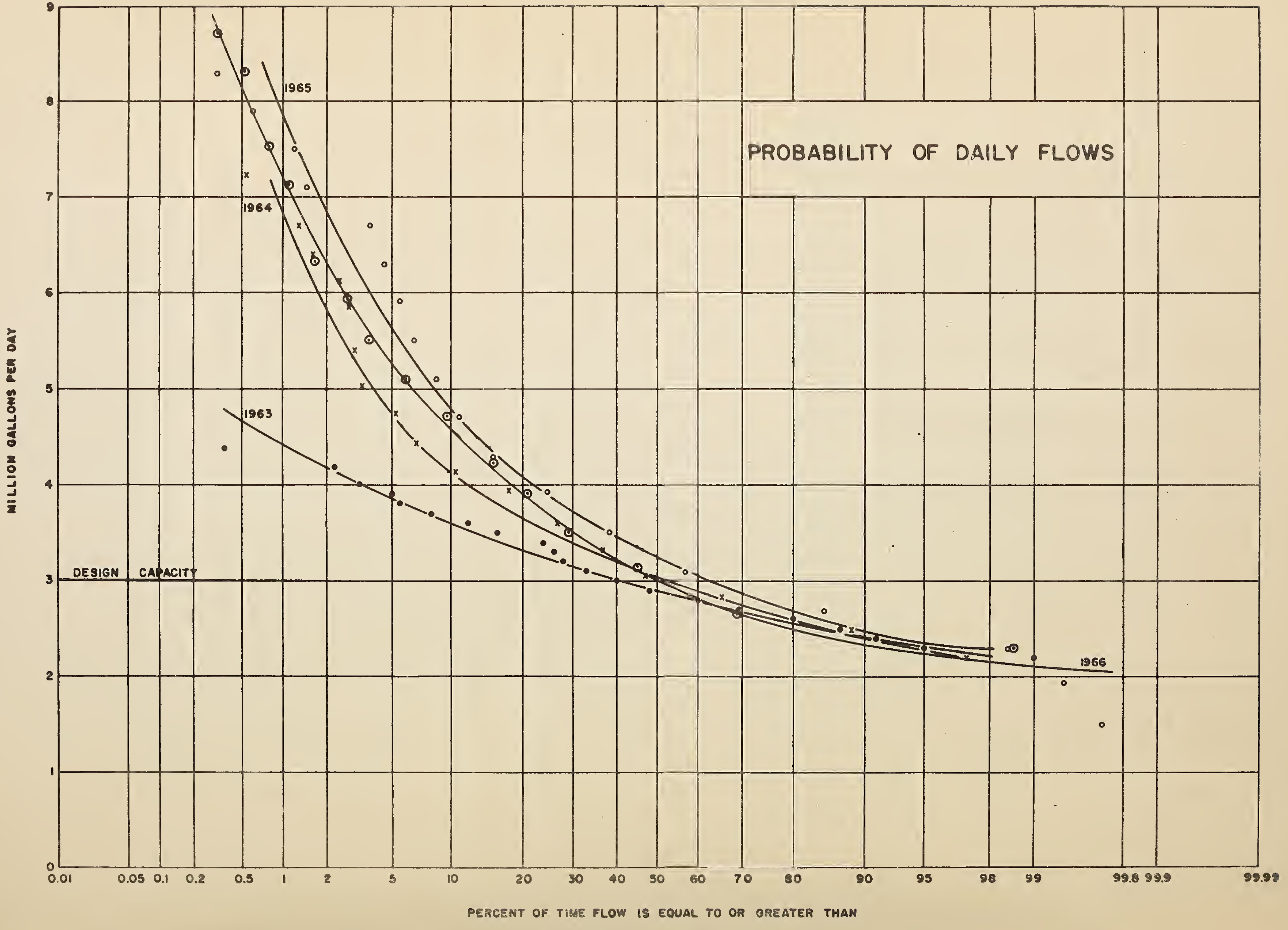


TOTAL ANNUAL COSTS

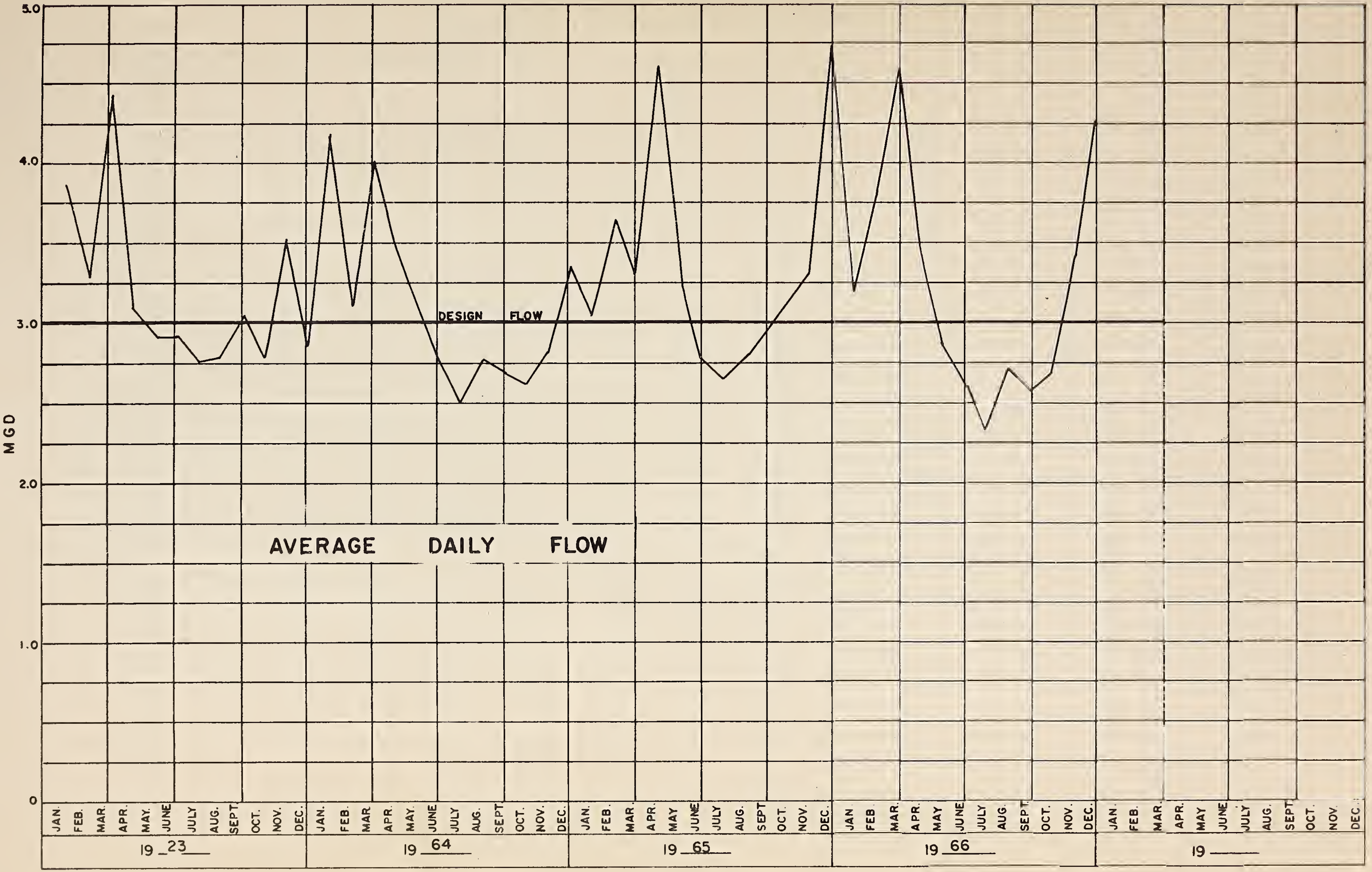


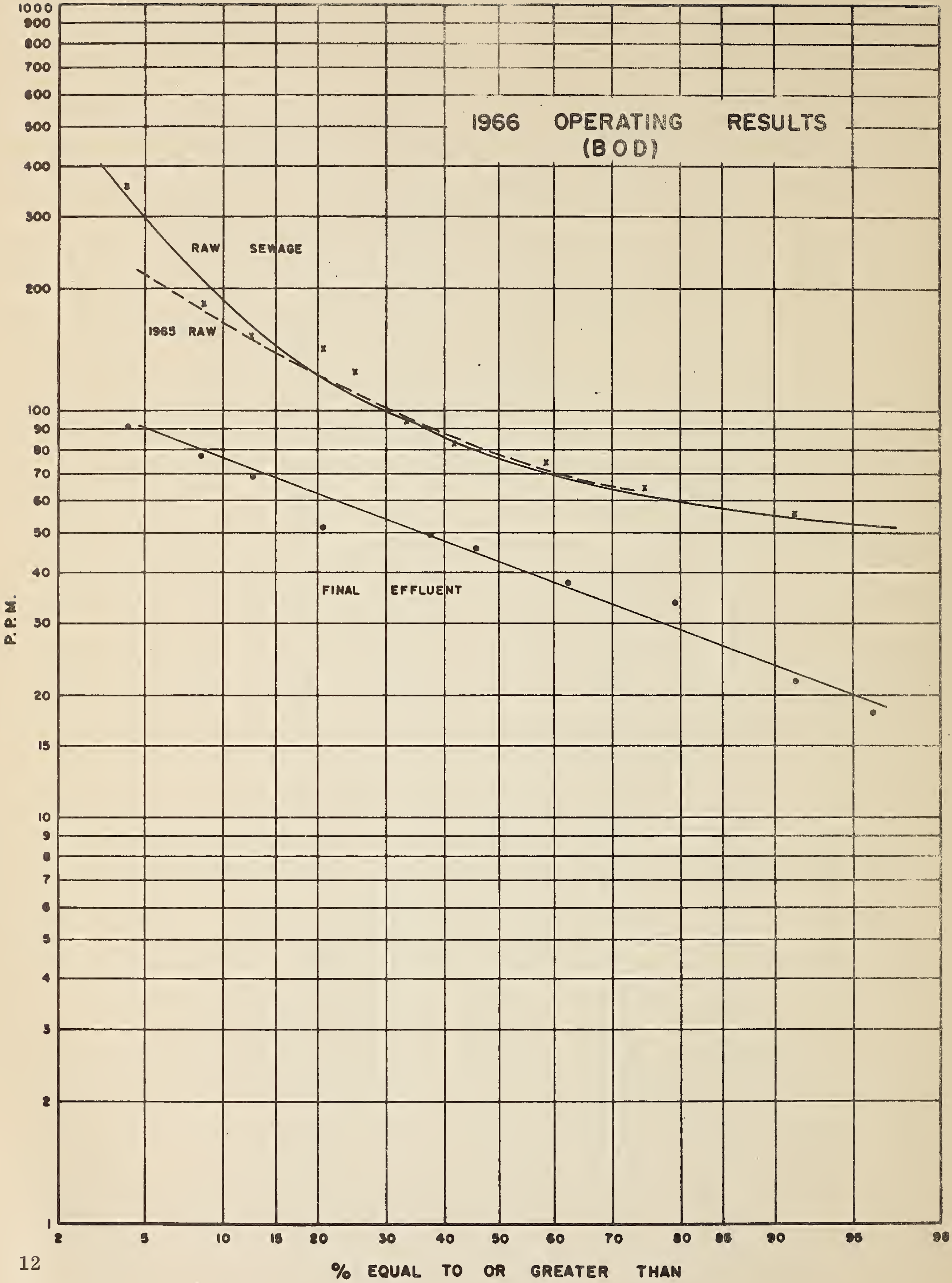
Process Data

The graph of flow probabilities shows that the plant was hydraulically overloaded 50% of the time in 1966. 'This is a 10% improvement over 1965 and may be due to the municipalities' efforts to control surface water entering the system.



PROBABILITY OF DAILY FLOWS


AVERAGE DAILY FLOW
DESIGN FLOW
MGD
5.0
4.0
3.0
2.0
1.0
0
JAN.
FEB.
MAR.
APR.
MAY.
JUNE
JULY
AUG.
SEPT
OCT.
NOV.
DEC.
19 23
19 64
19 65
19 66
19


1966 OPERATING RESULTS
(BOD)
RAW SEWAGE
1965 RAW
FINAL EFFLUENT
P.P.M.
% EQUAL TO OR GREATER THAN
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
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40
30
20
15
10
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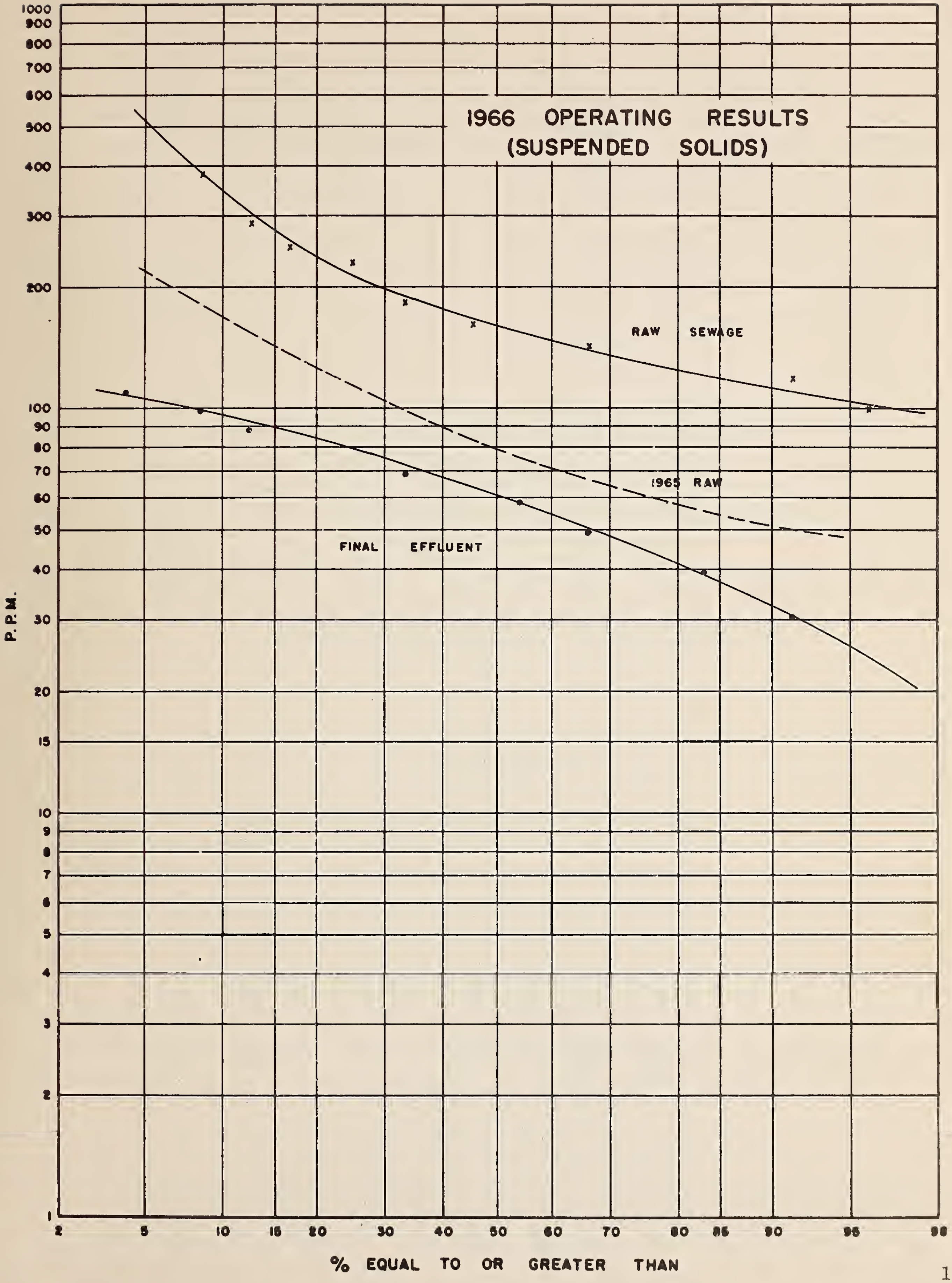
1966 OPERATING RESULTS
(SUSPENDED SOLIDS)
RAW SEWAGE
1965 RAW
FINAL EFFLUENT
P.P.M.
1000
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800
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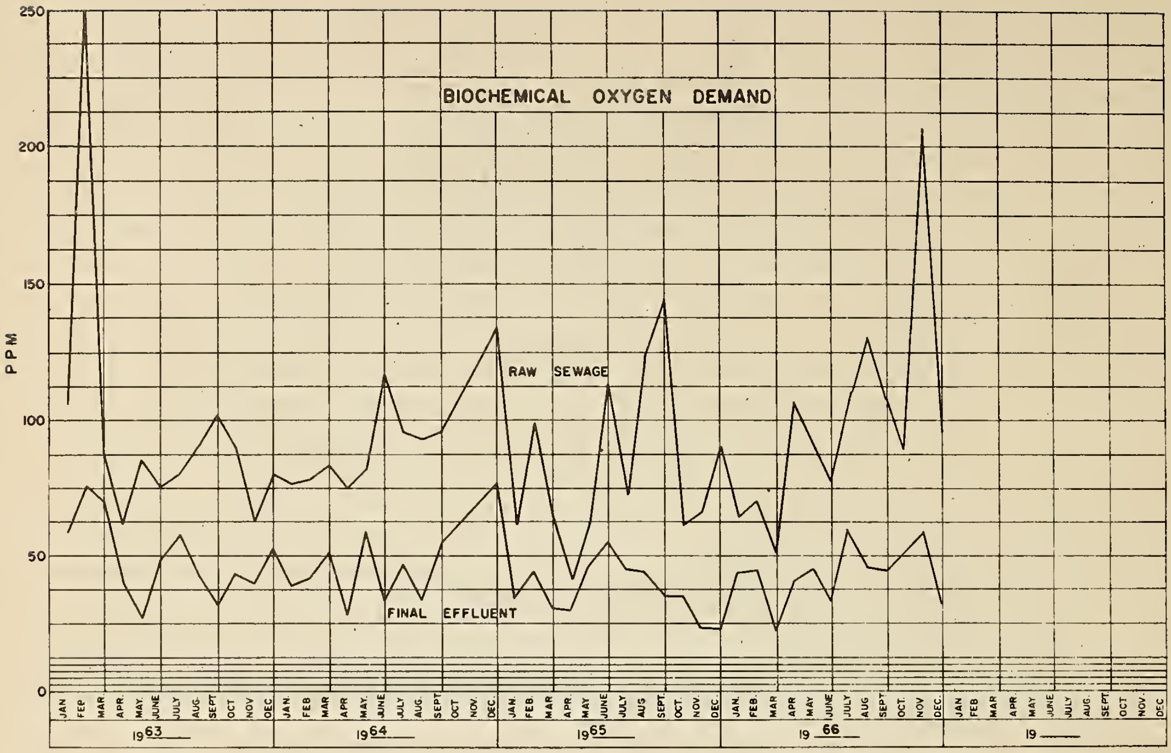
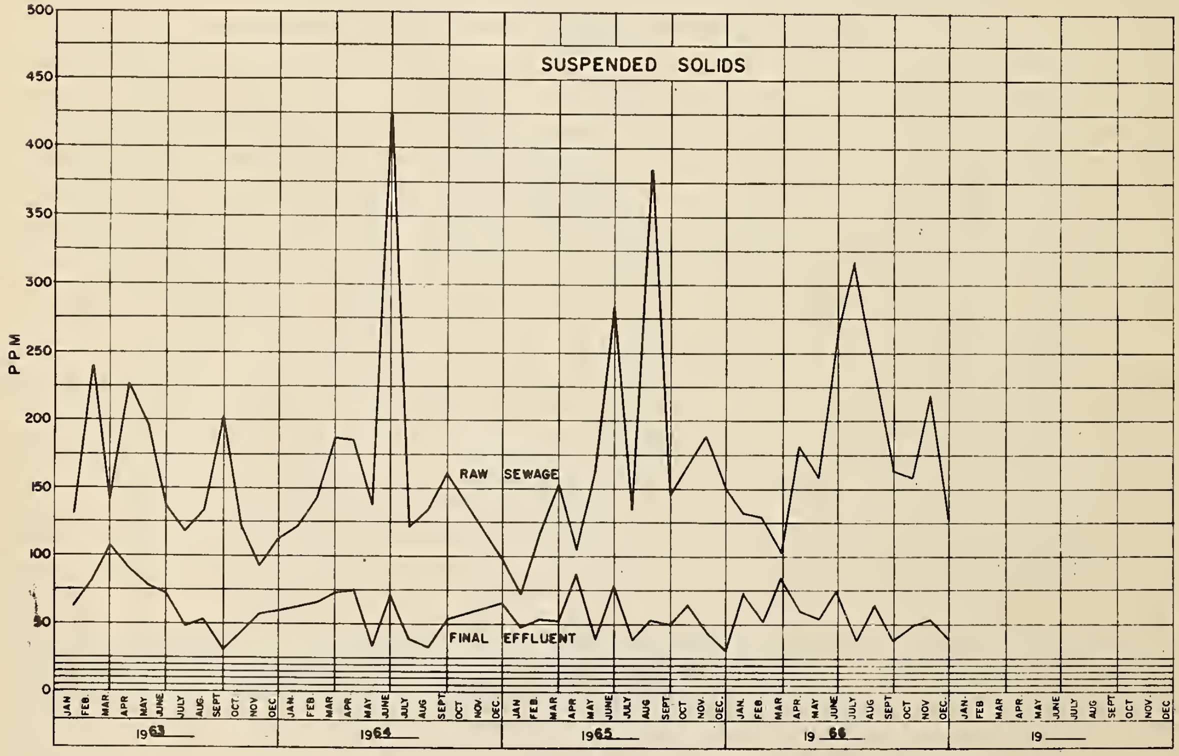
% EQUAL TO OR GREATER THAN



MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	
JAN.	64	43	33.0	10.4	131	72	45.0	29.1	89
FEB.	70	44	37.0	13.8	128	50	61.0	41.4	74
MAR.	51	22	57.0	20.7	101	82	19.0	13.5	95
APR.	107	40	62.5	34.9	180	58	68.0	63.6	51
MAY	92	45	51.0	21.1	158	54	66.0	46.7	57
JUNE	77	32	58.5	18.0	262	74	72.0	75.3	66
JULY	114	59	48.2	19.8	316	38	88.0	100.4	27
AUG.	130	45	65.5	34.6	234	63	73.0	69.7	98
SEPT.	107	44	59.0	24.3	162	36	78.0	48.7	66
OCT.	88	51	42.0	15.4	157	47	70.0	45.9	42
NOV.	207	63	69.5	72.0	217	51	76.5	83.0	79
DEC.	92	32	65.0	39.1	124	37	70.0	56.7	127
TOTAL	-	-	-	332.4	-	-	-	734.7	871
AVG.	100	43	57.0	27.7	181	55	69.5	61.2	73

COMMENTS

Although the strength of the raw sewage is slightly below normal, the percent removals of BOD and SS of 57 and 69.5 are good for this type of plant.

DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu. Ft.
	1000'S CU FT	% SOLIDS	% VOL MAT	1000'S CU. FT.	% SOLIDS	% VOL. MAT	
JAN.	39.74	7.00	3.23	12.34	-	-	190.45
FEB.	35.58	-	-	11.91	7.63	2.13	161.53
MAR.	39.74	-	-	3.02	10.70	2.73	124.78
APR.	38.46	-	-	-	-	-	142.06
MAY	39.74	8.85	4.17	-	-	-	178.12
JUNE	38.46	10.72	5.29	4.42	10.16	2.95	277.07
JULY	39.74	8.85	4.72	14.36	10.95	3.25	276.13
AUG.	39.74	17.42	8.73	5.36	7.70	2.12	260.19
SEPT.	38.46	9.34	4.53	3.85	8.75	2.62	252.72
OCT.	39.74	9.18	5.10	7.69	8.55	2.89	226.30
NOV.	38.46	8.66	4.75	8.46	6.02	2.03	249.53
DEC.	39.74	8.50	4.19	4.62	10.25	3.40	208.45
TOTAL	467.60	-	-	76.03	-	-	2547.33
AVG.	38.97	9.84	4.97	6.34	8.97	2.68	212.28

COMMENTS

It can be seen that the raw sludge, though high in solids, contains only 50% organic matter.

The inorganic solids have been accumulating in the secondary digester and it is proposed that the digester be drawn down and cleaned in 1967.

Because of the low organic content of the raw sludge insufficient gas is produced for heating purposes.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	98.60	-	-
FEBRUARY	106.20	-	-
MARCH	142.50	-	-
APRIL	104.20	-	-
MAY	89.80	*3332	3.83
JUNE	80.10	3215	4.01
JULY	72.20	2946	4.08
AUGUST	81.50	2995	3.67
SEPTEMBER	77.30	2910	3.76
OCTOBER	83.40	2985	3.58
NOVEMBER	100.00	**2835	5.68
DECEMBER	130.40	-	-
TOTAL	1166.20	21218	-
AVERAGE	97.18	3031	3.99

* Started chlorination May 2
** Discontinued chlorination November 15

COMMENTS

The plant effluent was chlorinated during fishing season, normally from May 1 to November 30.

An average dosage of approximately 4 ppm produced the required chlorine residual of 0.5 ppm.

Commencing in January 1967, the plant effluent will be chlorinated on an all year round basis since it is the municipalities' intention to draw their raw water from the Sound.

Date Due

CONCLUSIONS

The plant is hydraulically overloaded 50% of the time. Raw sewage is weak and there is every indication that infiltration is the cause of the hydraulic overload.

The 1966 Municipal Directory credits Owen Sound with a population of 17,955 and the plant facilities would be more than hydraulically adequate for immediate requirements if infiltration were reduced.

RECOMMENDATIONS

With the recent influx of industry to the area, close attention should be given to hydraulic flows from these industries as well as the organic and toxic loads.

ONTARIO WATER RESOURCES COMMISSION